



IFW

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of

KUMA et al

Atty. Ref.: 1417-551; Confirmation No.

Appl. No. 10/591,439

TC/A.U.

Filed: September 1, 2006

Examiner:

For: PROCESS FOR PRODUCTION OF CUMENE HYDROPEROXIDE

\* \* \* \* \*

January 24, 2007

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**SUBMISSION OF INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

Attached is a copy of the International Preliminary Report on Patentability (English version) mailed December 7, 2006 and issued in the underlying International patent application.

Please consider this information when examining the above-identified U.S. National stage application.

Respectfully submitted,

**NIXON & VANDERHYE P.C.**

By: \_\_\_\_\_

Arthur R. Crawford  
Reg. No. 25,327

ARC:eaw  
901 North Glebe Road, 11th Floor  
Arlington, VA 22203-1808  
Telephone: (703) 816-4000  
Facsimile: (703) 816-4100

From the INTERNATIONAL BUREAU

**PCT**

NOTIFICATION OF TRANSMITTAL  
OF COPIES OF TRANSLATION  
OF THE INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY  
(CHAPTER I OR CHAPTER II  
OF THE PATENT COOPERATION TREATY)  
(PCT Rules 44bis.3(c) and 72.2)

To:

OKADA, Kazuhiko  
Okada & Associates  
6F, Kudan Kangyo Bldg.  
10-1, Kudan-Kita 1-chome  
Chiyoda-ku, Tokyo 1020073  
JAPON



A233PCT

Date of mailing (day/month/year)  
07 December 2006 (07.12.2006)

Applicant's or agent's file reference  
A5017-WO

**IMPORTANT NOTIFICATION**

International application No.  
PCT/JP2005/003599

International filing date (day/month/year)  
03 March 2005 (03.03.2005)

Applicant  
MITSUBISHI CHEMICAL CORPORATION et al

**1. Transmittal of the translation to the applicant.**

The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter I).



The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter II).

**2. Transmittal of the copy of the translation to the designated or elected Offices.**

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following designated or elected Offices requiring such translation:

None

The following designated or elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

AE, AG, AL, AM, AP, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EA, EC, EE, EG, EP, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OA, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

**3. Reminder regarding translation into (one of) the official language(s) of the elected Office(s).**

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability (Chapter II).

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned within the applicable time limit (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Authorized officer

Masashi Honda

Facsimile No. +41 22 338 82 70

Facsimile No. +41 22 338 82 70

**BEST AVAILABLE COPY**

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference A5017-WO	FOR FURTHER ACTION		See item 4 below
International application No. PCT/JP2005/003599	International filing date (day/month/year) 03 March 2005 (03.03.2005)	Priority date (day/month/year) 04 March 2004 (04.03.2004)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant MITSUBISHI CHEMICAL CORPORATION			

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- |                                               |                                                                                                                                                                 |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Box No. I | Basis of the report                                                                                                                                             |
| <input type="checkbox"/> Box No. II           | Priority                                                                                                                                                        |
| <input type="checkbox"/> Box No. III          | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability                                                                |
| <input type="checkbox"/> Box No. IV           | Lack of unity of invention                                                                                                                                      |
| <input checked="" type="checkbox"/> Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> Box No. VI           | Certain documents cited                                                                                                                                         |
| <input type="checkbox"/> Box No. VII          | Certain defects in the international application                                                                                                                |
| <input type="checkbox"/> Box No. VIII         | Certain observations on the international application                                                                                                           |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

Date of issuance of this report  
29 November 2006 (29.11.2006)

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Authorized officer

Masashi Honda

Facsimile No. +41 22 338 82 70

e-mail: [pi08@wipo.int](mailto:pi08@wipo.int)

Form PCT/IB/373 (January 2004)

**BEST AVAILABLE COPY**

# PATENT COOPERATION TREATY

TRANSLATION

From the  
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing  
(day/month/year)

Applicant's or agent's file reference

**A5017-WO**

**FOR FURTHER ACTION**

See paragraph 2 below

International application No.

**PCT/JP2005/003599**

International filing date (day/month/year)

**03.03.2005**

Priority date (day/month/year)

**04.03.2004**

International Patent Classification (IPC) or both national classification and IPC

Applicant

**MITSUBISHI CHEMICAL CORPORATION**

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability: citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/JP

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2005/003599

Box No. 1      Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language  
\_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing  
☐ table(s) related to the sequence listing

b. format of material

- ☐ in written format  
☐ in computer readable form

c. time of filing/furnishing

- ☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2005/003599

Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1-5, 10-13	YES
	Claims	6-9	NO
Inventive step (IS)	Claims		YES
	Claims	1-13	NO
Industrial applicability (IA)	Claims	1-13	YES
	Claims		NO
2. Citations and explanations:			
<p>Document 1. JP, 8-511030, A (Rhône-Poulenc Chimie), 19 November, 1996 (19.11.96), pages 5-9, &amp; US, 6043399, A, &amp; EP, 712392, A1, &amp; WO, 95-4717, A1</p> <p>Document 2. JP, 2003-327576, A (Sumitomo Chemical Co., Ltd.), 19 November, 2003 (19.11.03), pages 2-4 (Family: none)</p> <p>Document 3. JP, 2003-231674, A (Sumitomo Chemical Co., Ltd.), 19 August, 2003 (19.08.03), page 2 (Family: none)</p> <p>Document 4. JP, 2000-63352, A (Mitsui Chemicals, Inc.), 29 February, 2000 (29.02.00), pages 2-5 (Family: none)</p> <p>Document 5. JP, 10-87609, A (General Electric Co.), 07 April, 1998 (07.04.98), pages 2-6, &amp; US, 5767322, A, &amp; EP, 816335, A1</p> <p>With regard to claims 1-5:</p> <p>These claims do not appear to involve an inventive step in view of documents 1-2 cited in the ISR.</p> <p>Documents 1-2 describe that a substance with an oxygen concentration of 20 % or more (or oxygen-enriched air) is used as the oxygen to be supplied when cumene hydroperoxide is produced by oxidizing cumene in the liquid phase. So a person skilled in the art could have easily further made the production amount of cumene hydroperoxide per amount of reaction liquid more than a predetermined amount.</p> <p>With regard to claims 6-9:</p> <p>These claims do not appear to be novel or to involve an inventive step in view of document 1 shown in the ISR.</p> <p>Document 1 describes that a substance with an oxygen concentration of 20 % or more is used as the oxygen to be supplied when cumene hydroperoxide is produced by oxidizing cumene in the liquid phase, and that the oxygen concentration of the gas to be discharged is kept at 2-6.5 %.</p> <p>With regard to claims 10-13:</p> <p>These claims do not appear to involve an inventive step in view of documents 1-5 shown in the ISR.</p> <p>Documents 3-5 describe that oxygen gas is supplied by a sparger. So a person skilled in the art could have employed, as required, a constitution in which the hole pitch of a sparger is twice or more the length of an aperture. Furthermore, producing phenol by oxidatively decomposing cumene hydroperoxide, is usually performed in the technical field concerned.</p>			